What is claimed is:

1.   A method for self writing track locations of a storage surface of a data disk of a disk drive, comprising the steps of:

   (a)   self-writing first servo bursts along a circular track via a transducer;

5   (b)   calculating repeatable runout correction values for the first servo bursts;

   (c)   self-writing second servo bursts along the track via the transducer such that the first and second servo bursts form a plurality of servo sector patterns that define the track centerline, wherein the second servo bursts are positioned using said correction values to essentially compensate for the runout in the first servo bursts and reduce the

10   overall track runout.

2.   The method of claim 1, wherein in step (c) the second servo bursts are written using the correction values such that the average track centerline is adjusted to essentially compensate for the runout in the first servo bursts.

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3.   The method of claim 1, wherein each servo sector pattern includes a trimmed burst pattern.

4.   The method of claim 3, wherein:

20   the step of writing the first servo bursts in each servo sector pattern further includes the steps of writing two servo bursts wherein one of the servo bursts trims the other servo burst, defining a first seam;

the step of calculating the repeatable runout correction values further includes the steps of calculating repeatable runout correction values based on differences between the intended positions of the first seams and the actual positions of the first seams as written, wherein said difference represent mis-placements of the first seams;

5 and

the step of writing the second servo bursts in each servo sector pattern further includes the steps of writing two servo bursts wherein one of the servo bursts trims the other servo burst, defining a second seam, such that the second seams are positioned using said correction values to essentially compensate for mis-placement of

10 the first seams, thereby reducing the overall track runout.

5. The method of claim 4, wherein each servo sector pattern includes a trimmed burst pattern comprising four radially offset, circumferentially staggered, servo bursts.

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6. The method of claim 1, wherein:

the step of writing the first servo bursts includes the additional steps of determining a position error due to repeatable runout at each of a plurality of points in the first servo burst pattern along the track addressed by the transducer head, and storing the

20 position error; and

the step of calculating the repeatable runout correction values for the first servo burst pattern further includes the steps of:

measuring a time domain impulse response of a disk drive servo

control system associated with said transducer head;

transforming said time domain impulse response into an error

transfer function;

5   taking the reciprocal of said error transfer function;

transforming said reciprocal error transfer function into an inverse

impulse response; and

convolving said inverse impulse response with said position error

at each of a plurality of said points in the first servo pattern to obtain a runout correction

10   value for each of said plurality of points.

7.   The method of claim 6, wherein the data disk includes a reference pattern

for determining said position error for self-writing the servo patterns, the method further

including the steps of generating the position error values based on the reference pattern.

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8.   The method of claim 7, wherein the step of generating the position error

values based on the reference pattern further includes the steps of reducing any existing

repeatable runout in the position error information that is obtained from the reference

pattern to obtain enhanced position information, and using the enhanced position

20   information as said position error values.

9.   The method of claim 6, wherein said step of transforming said time

domain impulse response into an error transfer function is performed using a Discrete

Fourier Transform.

10.   The method of claim 6, wherein said step of transforming said reciprocal error transfer function into an inverse impulse is performed using an inverse Discrete Fourier Transform.

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11.   A method for self writing track locations of a storage surface of a data disk of a disk drive, wherein the data disk includes a reference pattern for determining position information error for self-writing, the method comprising the steps of:

generating position information based on the reference pattern;

10   reducing any existing repeatable runout in the position information that is obtained from the reference pattern to obtain enhanced position information, and using the enhanced position information for self-writing servo bursts;

self-writing first servo bursts along a circular track via a transducer and concurrently determining a position error due to repeatable runout at each of a plurality of

15   points in the first servo burst pattern along the track addressed by the transducer head, and storing the position error; and

calculating the repeatable runout correction values for the first servo burst pattern by:

measuring a time domain impulse response of a disk drive servo

20   control system associated with said transducer head;

transforming said time domain impulse response into an error transfer function;

taking the reciprocal of said error transfer function;

transforming said reciprocal error transfer function into an inverse

impulse response; and

convolving said inverse impulse response with said position error

at each of a plurality of said points in the first servo pattern to obtain a runout correction

5   value for each of said plurality of points; and

self-writing second servo bursts along the track via the transducer such

that the first and second servo bursts form a plurality of servo sector patterns that define

the track centerline, wherein the second servo bursts are positioned using said correction

values to essentially compensate for the runout in the first servo bursts and reduce the

10   overall track runout.

12.   The method of claim 11, wherein the second servo bursts are written using

the correction values such that the average track centerline is adjusted to essentially

compensate for the runout in the first servo bursts.

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13.   The method of claim 11, wherein each servo sector pattern includes a

trimmed burst pattern.

14.   The method of claim 13, wherein:

20   the step of writing the first servo bursts in each servo sector pattern further

includes the steps of writing two servo bursts wherein one of the servo bursts trims the

other servo burst, defining a first seam;

the step of calculating the repeatable runout correction values further includes the steps of calculating repeatable runout correction values based on differences between the intended positions of the first seams and the actual positions of the first seams as written, wherein said difference represent mis-placements of the first seams;

5   and

the step of writing the second servo bursts in each servo sector pattern further includes the steps of writing two servo bursts wherein one of the servo bursts trims the other servo burst, defining a second seam, such that the second seams are positioned using said correction values to essentially compensate for mis-placement of

10   the first seams, thereby reducing the overall track runout.

15.   The method of claim 14, wherein each servo sector pattern includes a trimmed burst pattern comprising four radially offset, circumferentially staggered, servo bursts.

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16.   The method of claim 11, wherein said step of transforming said time domain impulse response into an error transfer function is performed using a Discrete Fourier Transform.

20   17.   The method of claim 11, wherein said step of transforming said reciprocal error transfer function into an inverse impulse is performed using an inverse Discrete Fourier Transform.

18.　　A hard disk drive having servo burst position correction, comprising:

a base;

a data disk comprising a reference pattern for providing position

information to self-write final servo patterns in a plurality of data tracks arranged

5　　concentrically about a spindle, wherein each of said data tracks is segmented into a

plurality of data sectors by servo sectors, wherein said disks may be rotated at a constant

velocity with respect to said base;

a transducer head for reading information from said data disk and for

writing information to said data disk, wherein said transducer head is movable in a radial

10　　direction with respect to said disk to address a selected one of said plurality of data

tracks;

a voice coil motor, interconnected to said transducer head, for moving said

transducer head with respect to said data tracks;

a channel for receiving signals, including position error signals, derived

15　　from said disk by said transducer head; and

a controller, interconnected to said voice coil motor, for controlling a

position of said transducer head with respect to said reference pattern, wherein the

controller writes final servo bursts on the data disk by self-writing first servo bursts along

a circular track via the transducer, calculating repeatable runout correction values for the

20　　first servo bursts and self-writing second servo bursts along the track via the transducer

such that the first and second servo bursts form a plurality of servo sector patterns that

define the track centerline, wherein the second servo bursts are positioned using said

correction values to essentially compensate for the runout in the first servo bursts and reduce the overall track runout.

19.   The disk drive of claim 18, wherein the second servo bursts are written using the correction values such that the average track centerline is adjusted to essentially compensate for the runout in the first servo bursts.

20.   The disk drive of claim 18, wherein each servo sector pattern includes a trimmed burst pattern.

21.   The disk drive of claim 20, wherein:

the first servo bursts include two servo bursts wherein the controller causes the transducer to write one of the servo bursts to trim the other servo burst, defining a first seam;

the controller calculates the repeatable runout correction values based on differences between the intended positions of the first seams and the actual positions of the first seams as written, wherein said difference represent mis-placements of the first seams and;

the second servo bursts include two servo bursts wherein the controller causes the transducer to write one of the servo bursts to trim the other servo burst, defining a second seam, such that the second seams are positioned using said correction values to essentially compensate for mis-placement of the first seams, thereby reducing the overall track runout.

22. The disk drive of claim 21, wherein each servo sector pattern includes a trimmed burst pattern comprising four radially offset, circumferentially staggered, servo bursts.

5   23. The disk drive of claim 18, wherein:

while writing the first servo bursts, the controller determines a position error due to repeatable runout at each of a plurality of points in the first servo burst pattern along the track addressed by the transducer head, and stores the position error; and

10   the controller calculates the repeatable runout correction values for the first servo burst pattern by convolving an inverse impulse response of a disk drive servo system with said position error at each of a plurality of said points in the first servo pattern to obtain a runout correction value for each of said plurality of points, wherein the inverse impulse response is obtained by measuring a time domain impulse response of a

15   disk drive servo control system associated with said transducer head, transforming said time domain impulse response into an error transfer function, taking the reciprocal of said error transfer function, and transforming said reciprocal error transfer function into an inverse impulse response.

20   24. The disk drive of claim 23, wherein transforming said time domain impulse response into an error transfer function is performed using a Discrete Fourier Transform.

25.   The disk drive of claim 23, wherein said step of transforming said reciprocal error transfer function into an inverse impulse is performed using an inverse Discrete Fourier Transform.